Research Centers and Institutes Overview

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Alison Harmon, Vice President for Research and Economic Development, MSU – Bozeman

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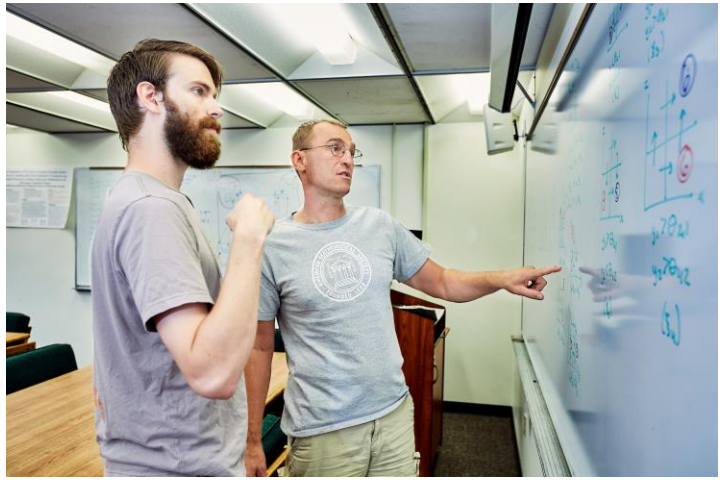
Why launch a research center?



Centers *advance and accelerate* research and discovery.

Criteria for launching:

1. Critical mass of faculty talent
2. Location and/or physical assets provide comparative advantage
3. Serves the state of Montana and beyond

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Research Center Benefits for Montana

- Allow coordination of research in areas that are a priority for Montana.
- Contribute to economic and community development.
- Foster cross-institutional partnerships.
- Host regional and statewide events.
- Create opportunities for technology translation.

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Research Center Benefits for the University

- Create visibility in research areas.
- Create intellectual communities.
- Recruit talented students and faculty members.
- Increase competitiveness for large institutional grants in areas where we have designated a center.

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Research Center Benefits for Researchers

- Allow faculty to find colleagues, collaborators and mentors
- Provide architecture around research and shared research infrastructure
- Allow for student/faculty collaboration.
- Provide seed grants for pilot projects to prepare for external grant opportunities.
- Expand the impact of faculty scholarship.

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Research Centers vs. Institutes

- Centers tend to be more research focused and disciplinary.
- Institutes may be more interdisciplinary or broader in their focus.
- Institutes integrate research with teaching and learning in the formal curriculum.

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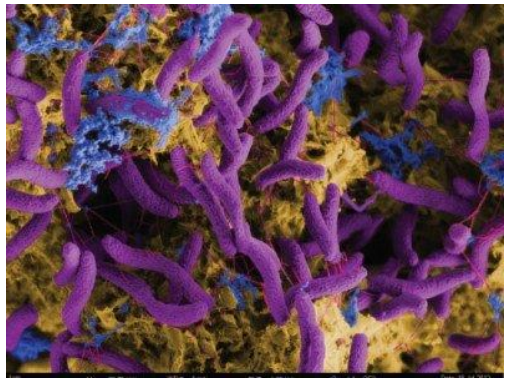
MSU 2026 Research Centers & Institutes



- Center for American Indian and Rural Health Excellence
- Center for Biofilm Engineering
- Center for the Communication of Science
- Center for Health & Safety Culture
- Center for Mental Health Research & Recovery
- Center for Research on Rural Education
- Center for Science, Technology, Ethics, and Society
- Energy Research Institute
- IDeA Network of Biomedical Research Excellence
- Institute for National Security Research & Education
- Institute on Ecosystems
- Ivan Doig Center
- Montana Engineering Education Research Center
- Montana Area Health Ed Center/ Rural Health
- Montana Manufacturing & Extension Center
- MT Space Grant & NASA EPSCoR
- Optical Technology Center
- Science Math Resource Center
- Spectrum Lab
- TechLink
- Thermal Biology Institute
- Water Center
- Western Transportation Institute

Spectrum LAB
Montana State University

Director: Dr. Krishna Rupavatharam
krishna.rupavatharam@montana.edu

History & Mission:

- Founded in 1999
- Controlled Unclassified Research Facility
- Develops and commercializes photonic and quantum innovations
- Transfers technology to Montana companies
- Provides educational and employment opportunities for students

Workforce Development Programs:

- Training programs for undergrads
- Training modules for 2 yar associates from Gallatin College
- Internships for High School students

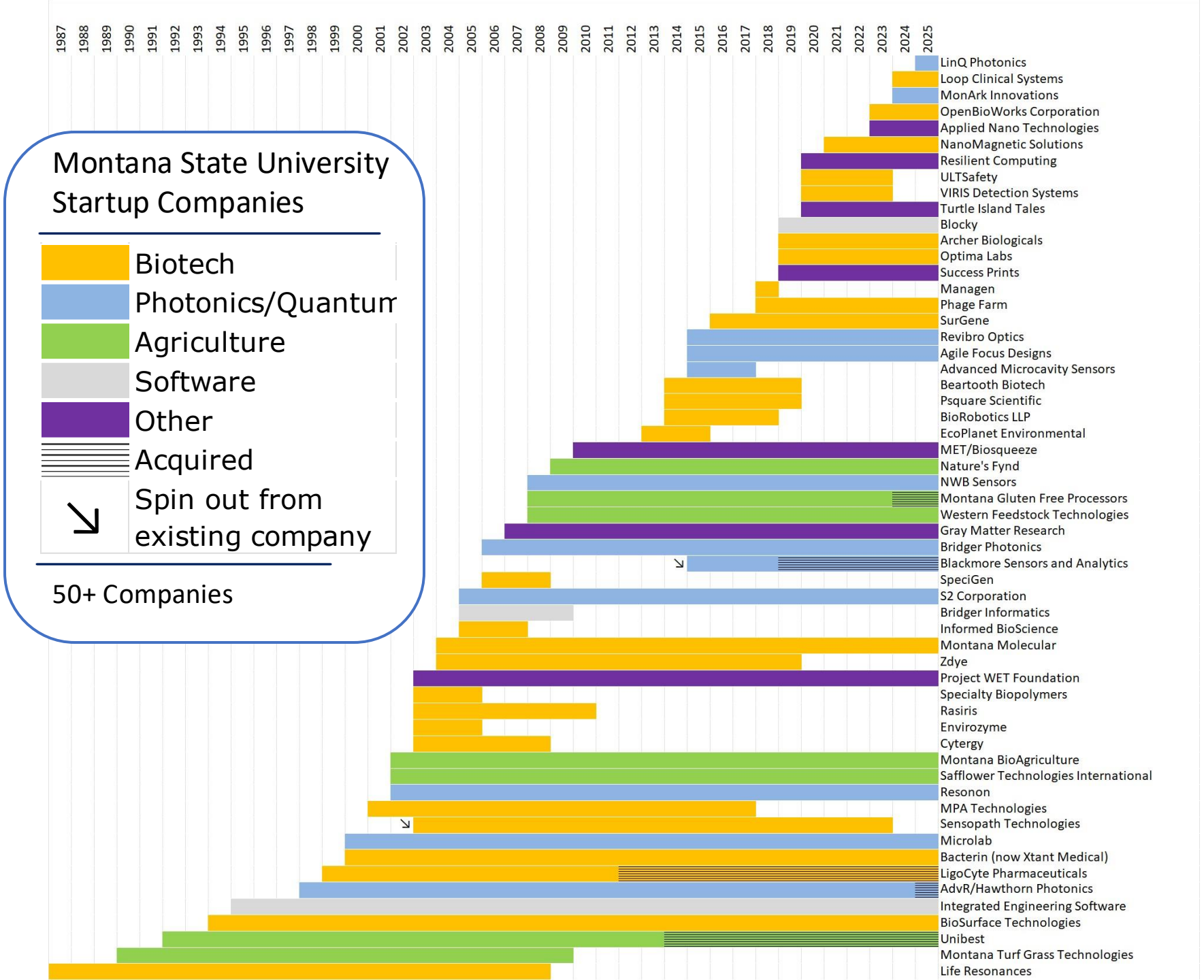
Notable Spin-Offs

Research Areas:

- Quantum Signal Processing
- Quantum Communications and Networking
- Geolocation
- LIDAR and Holography
- Integrated Photonics
- 3D Nano printing

Current Staffing:

- 12 professional staff are 100% MSU graduates
- 4 graduate students and 14 undergraduates
- $10M in research grants currently
- 70% of graduates are employed in the local tech sector since 2018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Loop Clinical Systems
MonArk Innovations
OpenBioWorks Corporation
Applied Nano Technologies
NanoMagnetic Solutions
Resilient Computing
ULTSafety
VIRIS Detection Systems
Turtle Island Tales
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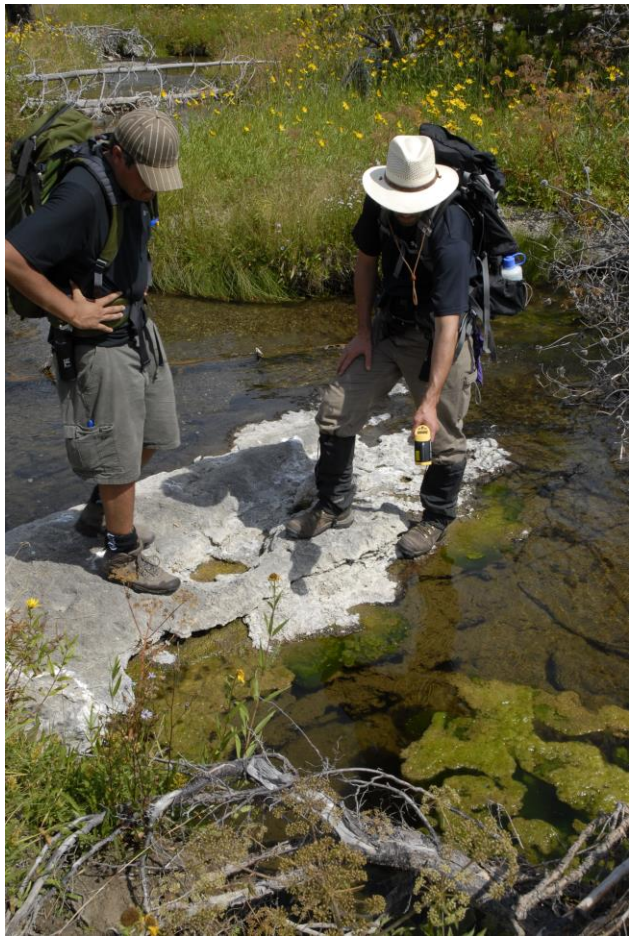
Archer Biologicals
Optima Labs
Success Prints
Managen
Phage Farm
SurGene
Revibro Optics
Agile Focus Designs
Advanced Microcavity Sensors
Beartooth Biotech
Psquare Scientific
BioRobotics LLP
EcoPlanet Environmental
MET/Biosqueeze
Nature's Fynd
NWB Sensors
Montana Gluten Free Processors
Western Feedstock Technologies
Gray Matter Research
Bridger Photonics
Blackmore Sensors and Analytics
SpeciGen
S2 Corporation
Bridger Informatics
Informed BioScience
Montana Molecular
Zdye
Project WET Foundation
Specialty Biopolymers
Rasiris
Envirozyme
Cytergy
Montana BioAgriculture
Safflower Technologies International
Resonon
MPA Technologies
Sensopath Technologies
Microlab
Bacterin (now Xtant Medical)
LigoCyte Pharmaceuticals
AdvR/Hawthorn Photonics
Integrated Engineering Software
BioSurface Technologies
Unibest
Montana Turf Grass Technologies
Life Resonances
Montana State University
Startup Companies
Biotech
Photonics/Quantum
Agriculture
Software
Other
Acquired
Spin out from existing company
50+ Companies

Centers and Institutes contribute to research expenditures

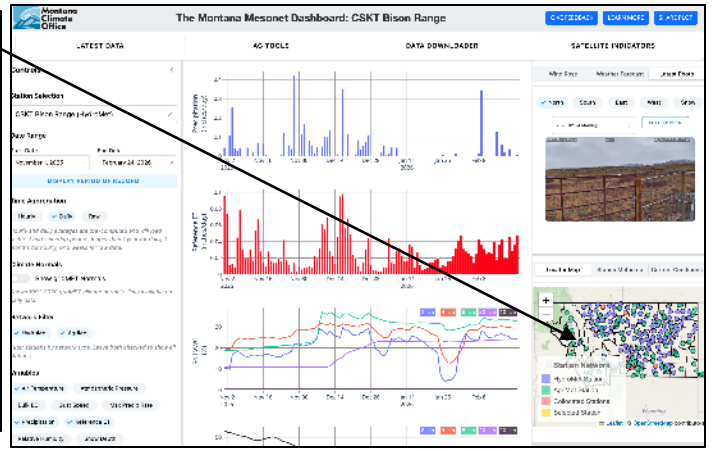
- Centers attract research funding.
- Centers account for approximately 50% of all MSU grants and contracts expenditures.
- MSU research expenditures have nearly tripled in 10 years.
  - FY2015: $108.4M
  - FY2025: $288.7M
- In large part this is due to the establishment of strong visible centers.



UM 2026 Research Centers & Institutes

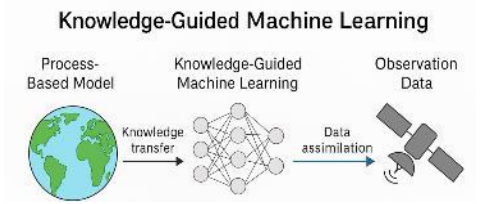
- American Indian Governance and Policy Institute
- Bureau of Business and Economic Research
- Center for Biomolecular Structure & Dynamics
- Center for Children, Families, and Workforce Development
- Center for Environmental Health Sciences
- Center for Integrated Research on the Environment
- Center for Population Health Research
- Center for Structural and Functional Neuroscience
- Center for Translational Medicine
- Clinical Psychology Center
- Cybersecurity Center
- Flathead Lake Biological Station
- Humanities Institute
- Maureen & Mike Mansfield Center
- Montana Avian Science Center
- Montana Biotechnology Center
- Montana Cooperative Wildlife Research Unit
- Montana Forest Conservation Experiment Station
- Montana Institute on Ecosystems
- National Center for Landscape Fire Analysis
- Neural Injury Center
- O'Connor Center for the Rocky Mountain West
- Rural Institute
- Skaggs Institute for Health Innovation
- Wilderness Institute

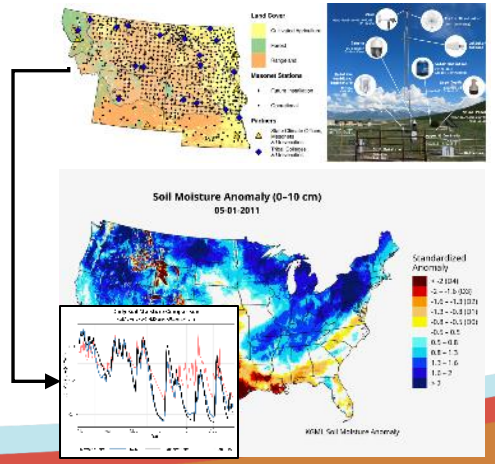
1. **Montana Mesonet**



- A world class weather, soil moisture & snow observing system across rural and tribal lands in Montana – 280 stations by 2028
- 5-minute data used by NOAA's NWS, River Forecast Centers and the Army Corps Reservoir Operations Team for predictions and the protection of lives, property, and water supplies

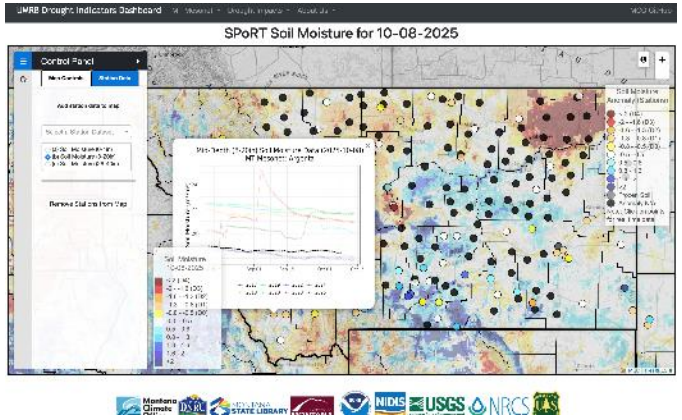
2. **Next Generation Data –Model Assimilation** for improved drought, flood, fire, and agricultural predictions

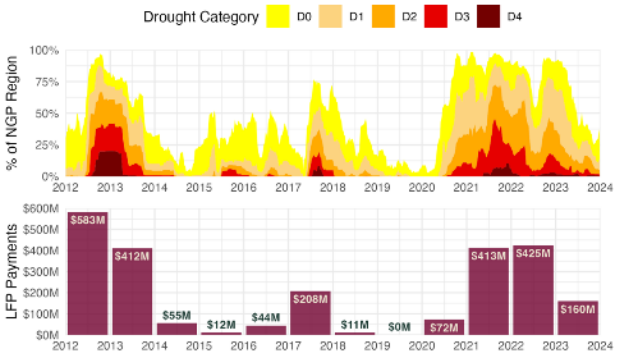




- Soil Moisture
- Groundwater
- Streamflow
- Fire Weather

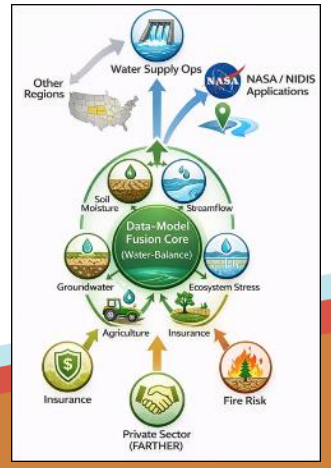
3. **Montana Drought Early Warning System**

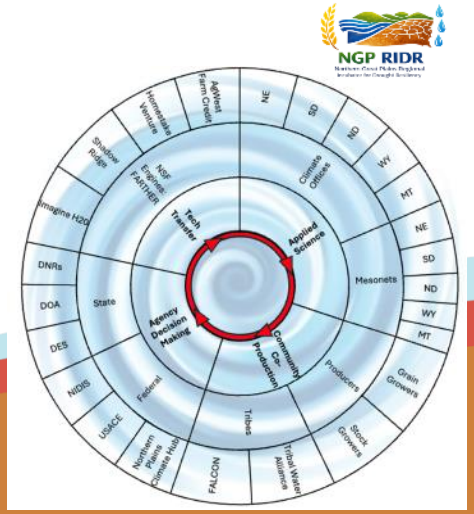




- Operational Dashboard for Weekly Drought & Water Supply Assessments by the DNRC & Governor's Drought & Water Supply Advisory Committee
- Improved characterization ensures more accurate allocation of millions in federal funds supporting producers and communities in Montana

4. **Regional Incubator in Drought Resiliency (RIDR) -** National Science Foundation Phase 1 Funding; Phase 2 Implementation - $15,000,000





Montana Climate Office · Montana Mesonet · nebraska mesonet · NDAWN · FARTHER VENTURES · AgWest FARM CREDIT · NorthWestern Energy · DNRC The Montana Department of Natural Resources & Conservation · NIDIS · NATIONAL MESONET Program Partner · NAWG National Association of Wheat Growers · Mesonet at SDSTATE · AASC American Association of State Climatologists · NEBRASKA STATE CLIMATE OFFICE · Great Plains Drought Early Warning System · NOAA · USGS science for a changing world

UM Startup Companies

Research

- Bosco Broth LLC
- CarbonNutra LLC
- CD3
- Dermaxon LLC
- Elephant Friendly Tea
- Fyr Diagnostics, Inc.
- Glia Diagnostics Pty Ltd
- Historical Research Associates, Inc.
- Inimmune Corp.
- Maana Discoveries, Inc.
- Predictive Hydrology, LLC
- Promiliad Biopharma Inc.
- Rio Pharmaceuticals
- Rivertop Renewables, Inc.
- South Fork Historical Research
- Speedgoat Wildlife Solutions LLC
- Sunburst Sensors, LLC
- Wintermute Biomedical Inc.

Information Technology

- AB Technology Solutions, Missoula, MT
- Elm Software Solutions
- Schmaing Technology Consultants
- Sound UX
- The IT Guy
- Tripro Systems
- Watson IT Solutions
- Whitefish Web Design

Consulting & Business Services

- Highland CNC Services

Transportation & Logistics

- Cannon Transportation
- Millennium Logistic
- Weave Industries / Warren Transport, Inc.

Agriculture & Environmental Services

- Arose Environmental, LLC
- Critter Getter Wildlife Control
- DKM Sustainable Forestry
- Ecological Solutions, Inc.
- Geum Environmental Consulting, Inc
- Kitesup Water Sports
- Mountain States Environmental Services
- Northeast Geoscience inc
- Quietwater Paddles
- Shannon Land & Water Services
- Stillwater Sod Corporation
- Vander Meer's Wildland Conservation Services
- Water & Sage, LLC

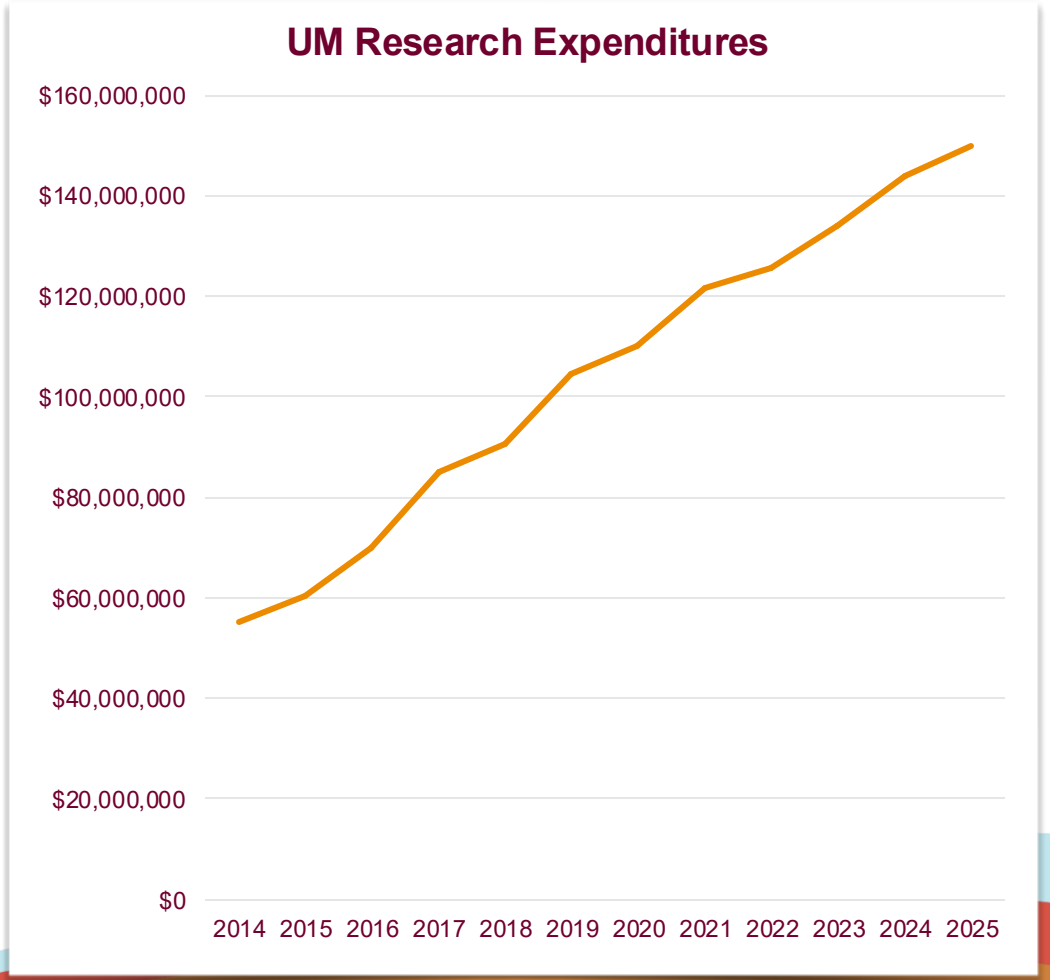
Manufacturing

- CAT 5 Composites
- Eagle Group (Automation Machinery Manufacturing)
- Econo Printing
- Unicorn Fabrication

*Does not include 36 professional program startups (PT, Pharmacy, Counseling, SW)

Impact on Research Expenditures

- At UM, Centers & Institutes account for 57% of all expenditures.
- Research expenditures have grown year over year since 2014, nearly tripling in that time.
  - 2014 - $55M
  - 2025 - $150M
- 17 Instrument CORES providing shared access to expensive equipment.



How are Research Centers and Institutes Funded

- Centers are expected to fund themselves with external grants, contracts, and gifts.
- Outlining a center's ability to do this is an important part of a center proposal.
- MSU and UM centers are very successful at winning grants. Grants pay both indirect and direct costs. A portion of indirect costs (10-30%) are used to pay for center operations.

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